

CLAIMS

1. Diagnosis system for household electric appliances such as refrigerators, freezers, and others, of the type presenting multiple loads (10) which are energized by switches (20) commanded by respective electronic controls (30) operatively coupled to a command module (50), which energizes the loads (10) and an interface (80) coupled thereto, characterized in that it comprises: a voltmeter (60) operatively coupled to the inlet of each load (10), so as to measure a first voltage (V_{off}) in the inlet of the loads (10) with the switches (20) opened, and a second voltage (V_{res} , V_{lamp} , V_{comp}) in the inlet of each load (10) with the respective switch (20) closed; a control unit (70) operatively associated with the command module (50) and with the voltmeter (60) and which is operated according to a sequence of tests that are selectively activated to receive from the voltmeter (60) the values of the first voltage (V_{off}) and of each second voltage (V_{res} , V_{lamp} , V_{comp}) and to process these values, indicating in the interface (80) the existence of failure in at least one of the elements defined by the command module (50), by the switches (20), and by the respective electronic controls (30) thereof, in case any second voltage (V_{res} , V_{lamp} , V_{comp}) presents a value that is equal to or higher than that of the first voltage (V_{off}).

2. The diagnosis system as set forth in claim 1, characterized in that the control unit (70) is operated so as to further process, sequentially, the values of each pair of second voltages (V_{res_Vlamp} , V_{lamp_Vcomp}) of two loads (10) with the respective switches (20) simultaneously closed, indicating in the interface (80) the existence of failure in at least one of the elements defined by the command module .

(50), by the switches (20, and by their respective electronic controls (30) and interrupting the sequence of tests, in case any second voltage (Vres, Vlamp, Vcomp) of each load (10) presents a value that is
5 equal to or higher than a limit voltage (Vlim) which is lower than the first voltage (Voff) and in case each pair of second voltages (Vres_Vlamp; Vlamp_Vcomp) of two loads (10) with the switches (20) simultaneously closed presents a value that is equal
10 to or higher than a processing voltage (Vprocl, Vproc2) which is lower than the second voltage of one of said two loads (10) whose activating means in the command module (50) are not being tested.

3. The diagnosis system as set forth in claim 2,
15 characterized in that the limit voltage (Vlim) has a value corresponding to about 87.5% the value of the first voltage (Voff).

4. The diagnosis system as set forth in claim 2,
characterized in that the processing voltage (Vprocl,
20 Vproc2) has a value corresponding to about 87.5% the value of the second load (Vres, Vlamp, Vcomp) of said load (10) selected from the two loads (10) with the switches (20) simultaneously closed and whose activating means in the command module (50) are not
25 being tested.

5. The diagnosis system as set forth in any of the claims 1 or 2, characterized in that the control unit (70) returns the command module (50) to the normal operation in the refrigeration appliance, after it has
30 indicated in the interface (80) the existence of failure in the operation of any of the elements defined by the command module (50), the switches (20), and the electronic controls (30).

6. The diagnosis system as set forth in any of the
35 claims 1 or 2, characterized in that the control unit

(70) indicates in the interface (80) the absence of failure in the loads (10), when the second voltages (Vres, Vlamp, Ccomp) measured by the voltmeter (60) are lower than the first voltage (Voff) and the latter is higher than a reference voltage (Vref) corresponding to a voltage value above which the first voltage (Voff) is compulsorily situated in the correct operational condition of the loads (10).

7. The diagnosis system as set forth in claim 6, characterized in that the control unit (70) compares the first voltage (Voff) with the reference voltage (Vref) only after it has compared the second voltages (Vres, Vlamp, Comp) with each other and verified they are equal or substantially equal.

8. The diagnosis system as set forth in claim 6, characterized in that the control unit (70) indicates in the interface (80) the existence of failure in any of the loads (10), when the respective second voltage (Vres, Vlamp, Vcomp) is higher than a minimum voltage (Vmin), which is lower than the lowest second voltage (Vres, Vlamp, Vcomp) in the inlet of each load (10) with the respective switch (20) closed.

9. The diagnosis system as set forth in claim 8, characterized in that the minimum voltage (Vmin) has a value corresponding to about 75% the value of the lowest second voltage (Vres, Vlamp, Vcomp).

10. The diagnosis system as set forth in claim 8, characterized in that the control unit (70) compares each second voltage (Vres, Vlamp, Vcomp) with the minimum voltage (Vmin) only after comparing said second voltages with each other and verified they are not equal.

11. The diagnosis system as set forth in claim 1, characterized in that the voltmeter (60) comprises a signal conditioning circuit (61) connected to the

inlet of each load (10) upstream the respective switch (20) and supplying voltage signals from said inlet of each load (10) to the control unit (70).

12. The diagnosis system as set forth in claim 11,
5 characterized in that the voltage signals of the inlet of the loads (10) are sent to an AD converter (62) connected to the control unit (70).

13. The diagnosis system as set forth in claim 1,
characterized in that the control unit (70) interrupts
10 the sequence of tests in case any second voltage (Vres, Vlamp, Vcomp) presents a value that is equal to or higher than that of the first voltage (Voff).